



Section 3.8

Activity 3.8.1

One reason why the future net cash flow forecasts of each of the following projects might be uncertain:

- Future sales of the new cars.
- The forecasted cost savings from the new system.
- The accuracy of the market research.
- How many car drivers will use the toll road.
- How much the power station will cost to build.

Activity 3.8.2

- 'Investment appraisal' is evaluating the profitability or desirability of an investment project.
- The payback periods for Project X and Project Y:

Year	Project X	Cumulative cash flow	Project Y	Cumulative cash flow
0	(\$50 000)	(\$50 000)	(\$80 000)	(\$80 000)
1	\$25 000	(\$25 000)	\$45 000	(\$35 000)
2	\$20 000	(\$5 000)	\$35 000	0
3	\$20 000	\$15 000	\$17 000	\$17 000
4	\$15 000	\$30 000	\$15 000	\$32 000
5	\$10 000	\$40 000	–	–

- Project X – $(\$5,000 / \$20,000) \times 12 = 3$ months and 2 years
- Project Y – 2 years.



3. ARR for project X and Y

- Project X: $(\$25\,000 + \$20\,000 + \$20\,000 + \$15\,000 + \$10\,000 - \$50,000) / 5 = \$8,000$
 $\$8,000 / 50,000 \times 100 = 16\%$.
- Project Y: $(\$45\,000 + \$35\,000 + \$17\,000 + \$15\,000 - 80,000) / 4 = \$8,000$
 $\$8,000 / \$80,000 \times 100 = 10\%$.

4. The financial factors that might affect Ashton Textiles' choice of project could be:

- Project Y pays back more quickly than X
- Project X has a higher ARR than project Y
- Project X has a lower initial investment than project Y.

The non-financial factors might be:

- Ashton's good relationship with the supplier of machine Y
- Machine X's mixed reviews on reliability
- Machine X is imported and affected by the exchange rate
- Project Y is supplied by a local firm.

Activity 3.8.3

1. 'Net present value' is the use of discounted cash flows to assess an investment project.

2. Net present value of the new gym:

Year	Net cash flows (\$)	Discount factor @ 14%	Present value
0	(850 000)	1	(850,000)
1	240 000	0.88	211,200
2	300 000	0.76	228,000
3	350 000	0.67	234,500
4	350 000	0.59	206,500
		NPV	30,200

3. If the discount interest rate increased, the net present value would fall as the cash flows are discounted at a higher rate.



4. On the basis of financial factors, the decision to open the new gym would be affected by:

- ARR of above 10% is acceptable
- Payback of 3 years is acceptable
- NPV is positive.

The non-financial factors might be:

- High profile city location
- Threat of a rise in interest rates
- Strongly growing market.

Activity 3.8.4

1. 'Payback' is the time it takes for the initial investment of a project to be repaid.

2. Payback and ARR for location A and B:

Year	Location A	Cumulative cash flow	Location B	Cumulative cash flow
0	(\$12 000)	(\$12 000)	(\$12 000)	(\$12 000)
1	\$3000	(\$9000)	\$6000	(\$6000)
2	\$4000	(\$5000)	\$5000	(\$1000)
3	\$5000	0	\$3000	\$2000
4	\$6000	\$6000	\$2000	\$4000
5	\$5000	\$11 000	\$5000	\$9000

- Payback location A – 3 years
- Payback location B – $(\$1,000 / \$3,000) \times 12 = 4$ months and 2 years
- ARR location A – $(\$3000 + \$4000 + \$5000 + \$6000 + \$5000 - \$12,000) / 5 = \$2,200 / 12,000 \times 100 = 18.3\%$
- ARR location B – $(\$6000 + \$5000 + \$3000 + \$2000 + \$5000 - \$12,000) / 5 = \$1,800 / 12,000 \times 100 = 15\%$.

3. On the basis of the ARR location A is more favourable and location B has the more favourable payback.



4. The NPV of location A and location B:

Year	Location A	DF 10%	Present value	Location B	DF 10%	Present value
0	(\$12 000)	1	(\$12,000)	(\$12 000)	1	(\$12 000)
1	\$3000	0.91	\$2730	\$6000	0.91	\$5460
2	\$4000	0.83	\$3320	\$5000	0.83	\$4150
3	\$5000	0.75	\$3750	\$3000	0.75	\$2250
4	\$6000	0.68	\$4080	\$2000	0.68	\$1360
5	\$5000	0.62	\$3100	\$5000	0.62	\$3100
		NPV	\$4980		NPV	\$4320

5. Location A should be chosen because it has the highest NPV.

6. Problems of using the NPV method of deciding between different investment projects might include:

- Interest rates change
- Inaccurate forecasts of net cash flows
- Inaccurate forecast of the length of the project.

Exam practice questions

1. Two difficulties Asia Print might have forecasting future sales include:

- The selling price of its product might change
- The units sold might be different to the forecast.



2. The payback of the ARR and payback period of project Y and Z:

Year	Project Y \$m	Cumulative cash flow	Project Z \$m	Cumulative cash flow
0	(20)	(20)	(12)	(12)
1	$(\$1.25 - \$0.5) \times 8 - 1 = 5$	(15)	$(\$1.25 - \$0.5) \times 6 - 0.5 = 4$	(8)
2	$(\$1.25 - \$0.5) \times 8 - 1 = 5$	(10)	$(\$1.25 - \$0.5) \times 6 - 0.5 = 4$	(4)
3	$(\$1.25 - \$0.5) \times 8 - 1 = 5$	(5)	$(\$1.25 - \$0.5) \times 6 - 0.5 = 4$	0
4	$(\$1.25 - \$0.5) \times 8 - 1 = 5$	0	$(\$1.25 - \$0.5) \times 6 - 0.5 + 0.5 = 4.5$	4.5
5	$(\$1.25 - \$0.5) \times 8 - 1 + 1 = 6$	4		

- Project Y: four-year payback
- Project Z: three-year payback
- Project Y: ARR $(5 + 5 + 5 + 5 + 6 - 20 / 5) / 20 = 6\%$
- Project Z: ARR $(4 + 4 + 4 + 4.5 - 12 / 4) / 12 = 9.4\%$

3. On the basis of financial factors:

- Project Z has a shorter payback period than project Y
- Project Z has a higher ARR than project Y.

On the basis of non-financial factors:

- Project Y: automatic, internet links, six redundancies, needs highly trained operatives
- Project Z: semi-automatic, limited facilities, reliable, three redundancies, complaints from local residents.



Key concept question

Investment appraisal plays the following role in business strategy and innovation:

- Guides future decisions on significant investment and innovation
- Provides analysis of future cash inflows and outflows of an investment and innovation decision
- Gives an assessment of the financial strengths and weaknesses of an investment and innovation decision
- Allows organisations to make an assessment of risk associated with strategy and innovation
- Can be used in conjunction with non-monetary factors associated with innovation and strategy.

Its weaknesses are:

- Market conditions change over time
- Inaccurate forecasted future cash inflows and outflows
- Difficult to balance the importance of monetary and non-monetary factors.